THE IMPACT STUDENT'S MOTIVATIONAL LEVELS HAVE ON AREA
STUDENT PERFORMANCE IN THE HVAC COURSES AT MILWAUKEE
TECHNICAL COLLEGE SOUTH CAMPUS

By

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ABSTRACT

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The Impact Student's Motivational Levels Have On Student Performance In the HVAC

Program at Milwaukee Area Technical College South Campus.
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The purpose of this study was to identify motivational levels of the students

entering the Heating Ventilating and Air Conditioning (HVAC) program at Milwaukee

Area Technical College South Campus. This study was also designed to develop

strategies that will attempt to improve student success. This research project used the

Motivational Analysis Test administered on the second day of class to determine the

students motivational levels. These student motivational levels were then compared to

their success in the HVAC program. Using the data gathered by this study, motivational

factors that would affect student success were developed. Student success, for the

purpose of this study, was determined by using the student's final grade in the course.

The data collected in this study was used to determine a relationship between some motivational factors and student success. The study was then able to determine strategies which would improve student success in the HVAC program at the South Campus.

ACKNOWLEDGMENT

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CHAPTER 1

INTRODUCTION

Milwaukee Area Technical College (MATC), Milwaukee, Wisconsin is one of the largest technical colleges in the nation, serving about 74,000 full-time and part-time students annually (MATC Registration Office 1996 - 97). MATC has four campuses, located in Milwaukee (Milwaukee Campus), Oak Creek (South Campus), West Allis (West Campus) and Mequon (North Campus). All of these campuses exist in heavily-populated, culturally diverse settings.

MATC's South Campus is the only campus which offers the Heating, Ventilating and Air Conditioning (HVAC) program. Therefore, the program draws students from the entire district, vastly increasing the cultural diversity of the HVAC students. A program that enrolls students from throughout the district will encompass many different definitions of success.

There is an old adage that states nothing succeeds like success. That old expression still rings true, and with regard to school learning it has been borne out by experimental evidence. The learner who encounters success seeks more of it. The learner who encounters repeated failure learns that there is little reason to try (C.M., Charles, 1976 p. 108). Every student makes choices that lead to success or failure. These choices determine a student's attitude when entering the class. This attitude may be interpreted by the teacher as an indication of a student's motivation.

Students exist in three different categories (Wlodkowski, 1978). Category one includes students who come to class motivated. Category two is made up of students who become motivated sometime after the class begins. Category three is comprised of students who never become motivated. In the book Motivating Learners, the authors state "Motivation is a word that

can be used to label or identify the relationship between how someone performs and what is expected of him, and the degree to which environmental events affect his behavior as expected" (Solace, Jackson, 1974, p.5).

Wlodkowski (1978) stated in his book, "With motivated students, communication flows, discipline problems lessen, anxiety decreases, and teaching can be the art that so many of us have been told that it is" (p.11). Developing motivation helps students to achieve more pleasure in the results of the learning experience (Einstein,1950). This learning experience will maximize the benefits and infuse motivation with productive thinking (Aschner, Bish, 1965). A common problem for most teachers is what to do in order to facilitate student motivation (Wlodkowski, 1977). According to these authors, motivation and motivated students will benefit student learning.

At Milwaukee Area Technical College, HVAC diploma students have problems succeeding. Last year in the HVAC courses, 18 students enrolled. Of these students, 14 graduated (MATC Registration Office, 1996-97). Some students come into class with low levels of motivation and consequently perform poorly. A need exists to develop motivational strategies to help diploma students at MATC South Campus succeed in their HVAC technical courses.

<u>Statement of the Problem</u>

A need exists to identify some motivational strategies that will improve student success in the HVAC technical courses. The focus of this study was to determine the impact student motivation levels have on student performance in HVAC courses at MATC's South Campus.

Purpose of the Study

The purpose of this study was to identify the motivational levels of the students entering the MATC South Campus HVAC program. These levels will be determined by using the Motivation Analysis Test (MAT) administered on the second day of class.

The second objective of this study will be to develop strategies that will attempt to improve student success. These strategies will help instructors motivate the students in the HVAC courses.   As these students gain in technical knowledge, data from this study will help meet the commitment made by MATC's President, John R. Birkholz, when he pledged to students that "MATC has a commitment to your success and to providing a quality education" (MATC   District Catalog 1997 - 98, p. iii).

Research Questions

The study was designed to gather data that addressed the problem. The following research questions were posed:

1. What is the motivational level of students entering the HVAC program at MATC South Campus?

2. What are the motivational characteristics that affect success in the HVAC program at MATC South Campus?

3. What motivation strategies will improve the student's success in the HVAC program at MATC South Campus?

4. What is the correlation between motivational levels and success in the HVAC program?

Significance of the Study

The results of this study were to determine what motivational levels were related to success in the HVAC diploma program at South Campus. If motivational levels of the students can be established at the beginning of the course, intervention strategies can be incorporated by the instructor. Data from the study helped develop motivational strategies that could be incorporated into the classroom, and these motivational strategies were shared with other instructors in the division.

Limitations

One limitation to this research study was the attitude of the students who took the MAT test the second day of class. Students in a technical program did not expect to be tested the second day of class.

 A second limitation was validating the test with a low number of participants. The only students taking the test are students enrolled in the heating course during fall term 1999.

The third limitation was that students did not have the proper reading skills. Poor reading and vocabulary skills may consume more time than is allotted to fill out the (MAT) test questions properly.

The fourth limitation was that there may be outside forces that affect the results, such as concern about the use of the test results. Another outside force may be how the student physically feels on the day the test is taken.

Definition of Terms

The following terms are defined, as used in this study, for clarity of the reading:

Success: The favorable or prosperous termination of laboratory reports and test scores, developed to provide exercises to improve skills in the HVAC program.

HVAC: This abbreviation stands for " heating, ventilating, and air conditioning"

and is a program that is primarily concerned with the inside environmental

conditions of both homes and buildings.

Experience: The process or fact of personally observing, encountering or undergoing,

have taken place or is in process.

Motivation: A word that can be used to label or identify the relationship between how

someone performs and what is expected of him, and the degree to which a person

controls his/her environment.

Motivational Levels: Is a method of classifying students by motivational intensity.

A student's motivational intensity will be characterized into different levels. The

students will be classified into three motivational levels - low-motivated students,

medium-motivated students and highly motivated students.

Motivational Characteristics: Are characteristics that can be identified which

differentiate between students' motivational levels. There are two groups of

motivational characteristics - good and bad. The data will identify students

as possessing characteristics that enhance or interfere with performance.

Motivational Strategies: A method of devising or employing a teaching plan set

on the goal of increasing student motivation. The data will allow for the

development of some motivational strategies.

MAT: This abbreviation stands for "Motivation Analysis Test". This test uses a

series of objective tests of ergic strength to measure the dynamic or motivational

trans structure of the examinee. The test is objective in the sense that the respondent

 is not aware of it's nature.

CHAPTER 2

LITERATURE REVIEW

Purpose Statement

The purpose of this study is to determine the impact student motivational levels have on student performance in HVAC courses at MATC South Campus. Factors that improve student motivation levels during HVAC courses will be identified.

Objectives

This study was designed to answer the following questions:

1. What is the motivational level of students entering the HVAC program at MATC South Campus?

2. What are the motivational characteristics that affect success in the HVAC program at MATC South Campus?

3. What motivation strategies will improve the students' success in the HVAC program at MATC South Campus?

4. What is the correlation between motivational levels and success in the HVAC program?

Motivation

The first concept that needs to be addressed in this literature review is the psychological aspect of the term motivation.   The word motive derives from the Latin movere, meaning "to move". Motives can be defined as hypothetical states within organism that activate behavior and propel the organism toward goals. (Rathus 1990). We do not measure motives directly but rather indirectly based on performance measures such as graduation, course completion or high course grades "The usefulness of our motivation theory is that it allows us to explain what gives a

person's behavior its energy and its direction. It is some motive that energizes the athlete, directs the student's behavior toward particular goals, make employees enthusiastic and focuses their attention, and gives purpose to everyday life. Motivation study deals with the processes that give behavior its energy and direction" (Reeve, 1992 p.7).

The author Reeve (1992) explained that motivation can be self-regulated or environmentally regulated. A motivational study needs to control both of these variables in order to be effective (p. 13). "Studies that can not control the environment loose some of their reliability. Educational facilities or group homes are considered to be the perfect place to perform a motivational field study" (Pentrich & Schunk, 1996).

Morgan (1993) had a very pessimistic view of the benefits derived from using motivation levels as an indicator of performance. In his view: "Motivation is often used to explain differences in performance, but motivation is a poorly defined concept and difficult to measure. Attempts to develop measures of motivation and to correlate them with performance have not shown any clear patterns" (p. 27).

The Motivation Analysis Test (MAT) was developed within a psychometric / individual differences perspective on motivation, a topic more closely associated with experimental-manipulative approaches (Cofer & Appley, 1964). A related instrument derived from the framework is the School Motivation Analysis Test, which pertains to the narrower domain of academics. On first inspection, the MAT has several positive features. First, it was developed internally within a conceptual framework to assess the "dynamic calculus" theory proposed by R. B. Cattell.

There are two types of motivation that have been considered in this study -- these are intrinsic motivation and extrinsic motivation. In order to determine the factors that affect

motivation, this study needs to distinguish between the two types of motivation. "Intrinsic motivation is choosing to do an activity for no compelling reason, beyond the satisfaction derived from the activity itself --- it's what motivates us to do something when we do not have to do anything. Many psychologists believe that humans are intrinsically motivated to seek out and to master challenges" (Raffini J., 1996, p.3). "Extrinsic motivation is the type of motivation characterized by people who respond to rewards and punishments" (Raffini, 1996, p.1). Motivation is also a dynamic process rather than a static condition. Collecting data using a test will only provide motivational levels for a snapshot in time. "Different emotions characterize different stages of the dynamic rise and decline of a motive" (Folkman & Lazarus, 1985).

Motivation Levels of Students

In order to understand the term "student motivation" we have considered that all students fit the psychological profile of people. After all, students are people, and we will now define how motivation fits into a student's life. Student motivation is a term that many teachers use but few understand. To all teachers, instead of thinking that one must motivate children, Dr. Deming reminded that all children are born motivated. Educators are meant not to motivate children to learn, but to discover what demotivates them, and stop those practices. He wrote, "We have been destroying our people, from toddlers on through the university, and on the job" (Deming, 1990, p. 1). Teachers fail to understand how complex the term "student motivation" really is. This unit will first consider student motivation in general and finely narrow the focus.

Most teachers believe that it is better to have motivated students than unmotivated students. "When teachers in higher education discuss their problems, a fairly frequent complaint is that students are not motivated" (Beard & Senior, 1980, p. 1). Teachers who say this explain

that: "Students lack an urge to work independently, applying themselves only if external pressures are exerted" (Beard & Senior, 1980, p. 2).

Some older teachers even claim that students today are not as motivated as students were in the past. "There are genuine differences between the present generation of students and that of their parents of earlier generations." Students admit during program advising that they are motivated but most students also admit that they are not as motivated as they would like to be.

The student perspective is that motivation is something that should be handed out during the orientation. This perspective aligns with the concept of holistic motivation. For example, using an orientation to understand various motivational techniques during an open lab (Sagar & Strang, 1985).

Teachers believe that their only concern with student motivation is in the amount that each student possesses. As the researcher concludes: "The only feature of motivation that varies is its amount, or its intensity, and the only concern about motivation is how much" (Reeve, 1992 p. 12).

Research has shown that students with very low motivation will be more likely to drop out of a program or even drop out of school. "Failed students were asked by questionnaire about the main reason for their difficulties in college. One of the reasons that was frequently mentioned was lack of motivation or not enough hard work" (Beard,& Senior, 1980, p. 47). Educators have been faced with the student drop out problem ever since data has been collected. Student motivation or the lack of motivation is said to be the major reason most students drop out of a program. Csikszentmihalyi (1982) found that "students in higher education succeed or fail in terms of motivation, not cognitive transfer of information" (p. 27). When instructors in

higher education start to consider the problem, they look at students who drop out as the lowest motivated students. These students more frequently demonstrate failure than students who do not satisfactorily complete the course work. Other researchers found: "A person who has failed with some regularity will probably tell you with some accuracy that he expects to fail again. However, he believes the cause of this failure is not his attitude or low motivation; these are all results of whatever situation factors have led to his not learning as he should in the first place" (Sloane, Jackson, 1974, p. 54).

The second group of students are considered by Wankowski (1973) - students who need a settling-in period. He has emphasized adjustment to academic work as the area in which lecturers and tutors may do most to assist the settling-in of new students (p.11.) These students are motivated but require time to settle into class, however, this is a luxury they can not afford (Beard and Senior, 1980). For some students, the effects of pronounced initial disorientation persisted throughout the course with those suffering in this way tending to obtain lower skill levels than students coping successfully in the first stages (p. 13). Students in many instances become motivated, but sometimes too late. These students would benefit the most from this study.

The third group consists of students who come into the class motivated. As Beard and Senior (1980) pointed out, A-level grades seem to be the best initial predictor, poor as they are as indicators of success (p. 80). Research has shown that motivation of students in universities and colleges is largely a matter of suitability of courses to their varied needs, initial experiences which enable them to adjust to independence and study methods appropriate to higher education, to stimulating teaching and informative assessment of their performance (Beard, Semior, 1980 p.

91). This study gathered data from these students to try and determine motivational

characteristics.

<div align="center">Motivational Research</div>

Over the years, there has been a vast amount of research dealing with the topic of

motivation in education. Thus far, most of this research was developed for children in

elementary and liberal arts education and has failed to be useful for adults in a practical

laboratory situation. What little research there may be has also failed to reach the teachers.

Teachers that want the best research information for their students because "when a student

learns and feels an actual sense of progress and real accomplishment, there is significant

motivation for future effort and learning in a similar direction" (Wlodkowski, 1978 p. 134).

Table 1

DEFINING INDEPENDENT AND DEPENDENT VARIABLES

Author	Independent Variable	Dependent Variable
Wlodkowski	Motivation	Success
Ball	Attendance	Performance
Russel	Basic Motivation	Basic Needs
Ames	Peer Pressure	Positive or Negative Performance

Most of the current research was conducted using scientific inquiry and reflective

thinking. This method of research allows for the greatest measure of interpretation. Some of the

limitations that affect the reliability of the research are: 1) The overall bias the researcher has

when asking the questions; 2) The relationship between the researcher asking the questions and

the student; 3) How the researcher asks the questions; and 4) How the student hears the question.

Many of these limitations are more of a problem with the scientific inquiry and the reflective

thinking method of collecting data.

Some of the researchers use a developed test. The origin of the research needed could be either academic research or applied research. By the very nature of the studies, most of the authors used the academic educational research plan.

Student Motivational Testing

If reasons for student success can be determined (De Charms, 1976), motivation training does in fact affect measures of motivated behavior (p.104). During approximately the last ten years, attempts have been made to add tests of personality to measures of attainment and teachers' assessment, with a view to developing a predictive measure based on all of these. Most of these attempts have used either Eysenck's Personality Inventory or Cattell's 16 Personality Factors. Unfortunately, tests of many personality variables prove unreliable in the sense that there are marked variations in patterns of relationships found in similar samples of individuals (Beard & Senior, 1980, p. 85). McReynolds (1965) points out that tests can help identify personal characteristics, certain influential internal conditions, certain internal processes that we call motivational (p.33).

Motivational Characteristics

One of the most misunderstood theories is that intelligent students do better in school. Savage (1972) reported that students who do well are usually no more intelligent on average than those who do poorly (p. 68). What characteristics make a difference when determining motivation levels of students? "The tendency to avoid failure motivates the individual to defend against the loss of self-esteem, the loss of social respect, and the fear of social punishment and embarrassment (Birney, Burdick, & Teevan, 1969, pp. 48-50). A need exists to understand students' motivational characteristics. Some characteristics have already been identified. Students enter tasks with differing aptitudes and prior experiences that influence their initial

sense of self-efficacy for learning. Aptitudes include general abilities, task-specific skills, interest attitudes, and personality characteristics (Cronbach & Snow, 1977).

Motivation Strategies

A general strategy has been researched by Olds (1994), wherein the teacher feels he/she can support the motivation of his/her students as well as overcome impediments to their motivation by developing close human relationships with them, based upon strong mutual trust (p. 57). In the process of providing motivation to the students (Wright, 1974), teachers must provide learning opportunities that will help the students develop positive self-concepts and a sense of responsibility and self-reliance (p. 69). The authors Drew and Olds (1974) determined there's a big connection between self-image and motivation.

Some strategies teachers can use to help implement the classroom application of motivated learning include:

1. Make it clear that students are competent to learn the material being taught.

2. Point out how the learning will be useful in students' lives.

3. Teach student learning strategies and show them how their performance has improved as a result of strategy use.

4. Present content in ways students understand and tailor instructional presentations to individual differences in learning.

5. Have students work towards learning goals.

6. Ensure that attributable feedback is credible.

7. Provide feedback on progress in learning and link rewards with progress.

8. Use models that build self-efficacy and enhance motivation.

Motivational Levels and Success

One of the research findings of Atkinson (1964) assumed that achievement behaviors were guided not only by a tendency to approach success but also by a tendency to avoid failure (p. 138). When working with students, Pintrich & Schunk (1996) point out that success generally raises self-efficacy and failures lower it (p. 180). Most students believe the harder they work the more successful they will be. Success attributed to great effort should raise efficacy less than if minimal effort is required, because the former implies that skills are not well developed. Self-efficacy remains high as long as learners believe they can maintain the level of effort needed to succeed.

CHAPTER 3

RESEARCH METHODS

Introduction

The purpose of this study was to determine the impact student motivational levels have on student course performance in Heating, Ventilating and Air Conditioning (HVAC) courses at MATC South Campus. Factors that improve student motivational levels during the HVAC courses will be identified.

Following are the questions that this study will focus on:

1. What is the motivational level of students entering the HVAC program at MATC South Campus?

2. What are the motivational characteristics that affect success in the HVAC program at MATC South Campus?

3. What motivation strategies will improve the student's success in the HVAC program at MATC South Campus?

4. What is the correlation between motivational levels and success in the HVAC program?

This chapter includes the purpose statement, research questions, research design, the population and how they were selected, the instrument that was used to collect information, data collection, analysis procedures, and limitations of this study.

Research Design

The study model used is the single-sample correlation design. In this design the correlation between individual motivation and his/her course performance in the HVAC is established.

The motivation data and student test performance will be organized in straight forward tables summarizing the average, range, distribution of the scores. To establish the relation between motivation and course performance, the person product moment correlation will be presented in a matrix. Research attempted to show the difference between many variables aimed at answering these perplexing questions.

Applied research is action-based research directed more at formulating decisions. The first part of the investigative research determined what the motivational levels of the MATC South Campus HVAC certificate students are upon entering the program. This information provided needed data that will establish existing motivational levels.

Understanding these existing motivational levels will lead to a descriptive study to determine how motivational levels affect student success and if any factors can be identified. This descriptive study discovered if there is an answer to this very important question (Enory, Cooper, 1991). The first question that this study addressed is: What is the connection between motivation and success? An answer to this question provided direction to the faculty as they planned their instruction.

The second part of this study monitored the success of the HVAC students on a quarterly basis. Monitoring that level will determine if anything has changed in their performance.   If there are changes in performance at some point during the semester, this study will note when the change occurred. The next step is determining why the change occurred. This study used final grades, as a tool for measuring student success, and these final grades, when compared to the motivational test, will determine if motivation levels have any bearing on student success.

The third part of this study was conducted by using the interviewing research method. This research method helped determine why students dropped out of the program. Was there a

change in the student's motivational level and why did these changes occur? Can the instructor

take any action and can the instructor facilitate the change more quickly?

<div align="center">Population</div>

This study involved the relationship between motivation and course performance, this

study selected HVAC students enrolled at MATC South Campus, in the fall semester 1999 -

2000. The population, who will be involved in providing this research data, are 100 percent of

the students enrolled in the course entitled Gas and Oil Burner Servicing. The class met on

Wednesdays once a week, for a total of seventeen classes per semester, and consists of between

fifteen to twenty students. Historical data shows that the average age is thirty-one, with students

that range in age from eighteen to fifty-five. Most of these students have a hands-on, working

background either from past employment or from their family background. Their typical

absentee rate averages about one and one-half classes per semester.

This is fewer than normal for similar classes at MATC South Campus. Most students

have a strong work ethic, and that is why the absentee rate is so low. With students coming from

such varied employment backgrounds, this motivational data is needed to help students become

successful faster. Having students in class for only seventeen weeks makes it important that they

are motivated near the start of class or as soon after the start as possible.

<div align="center">Instrumentation</div>

Motivational Analysis Test (MAT) has been used for more than twenty years and has

proven its validity as an accurate source of motivational data. The test is designed for high

school seniors and adults and provides measures of ten important comfort, social and

achievement needs scored for drive, satisfaction, interest and conflict. This test was used in this

study to determine motivational levels of MATC South Campus students entering the HVAC program.

<div align="center">Data Collection</div>

The MAT test was administered to all the students at MATC South Campus enrolled in the HVAC certificate class, Gas and Oil Burner Servicing. The instructor administered the pre-test MAT in the first hour of the second class. This gave the students a chance to settle into the new environment before a test situation. The MAT looks at a person's interests, drives, and strengths of sentiment and value systems. The test normally takes less than one hour and concentrates on ten psychologically meaningful unitary motivation systems, as well as using newly validated objective test devices for measuring these interest strengths. After collecting the pre-test data administered on the second day of class, each student's motivational level was established.

Student performance was measured two times during the semester. Student performance was tracked at eight weeks and sixteen weeks. For this study, student numbers were used, so student names were not revealed.   Grades were used to indicate student performance. This evaluation consisted of a review of the students' attendance, daily laboratory reports, quizzes and tests. The study tried to determine if there was a correlation between motivational levels and performance.

The course syllabus clearly pointed out all the factors that affect student success. The factors used in this class to indicate student success were developed by the advisory committee. Employers have indicated that a student's performance and success are closely linked.   Classes with a strong hands-on component rely on student performance to prepare the students for industry. The interview research method to gather data was conducted using a question sheet as

a tool to determine if any motivational characteristics could be identified. Students who had

increased their level of performance over the semester were interviewed to determine what

accounted for the change. Students who had high levels of motivation were also interviewed to

determine motivational characteristics that accounted for their initial motivation.

The MAT test was given to all remaining (students who had not dropped the course)

MATC South Campus HVAC students. Motivational data was compared to the student's final

grades to determine if there was a correlation between motivation and success.

Data Analysis

Data for each student was analyzed by providing descriptive tables for all motivational and

performance variables. After scoring each MAT test, the motivational factors were grouped, and

described. Similarly, academic performance data (i.e., midterm and final grade) were also

collected and organized with descriptive tables. All motivational factors were then related to the

course performance to help identify the best predictive motivational factors of academic success.

CHAPTER 4

RESULTS AND DISCUSSION

The purpose of this study was to identify the motivational levels of the students entering the Milwaukee Area Technical College (MATC) South Campus Heating, Ventilating, and Air Conditioning (HVAC) program. These levels were determined by using the Motivational Analysis Test (MAT) administered on the second day of class.

The second objective of this study was to develop strategies that will attempt to improve student success. As these students gain technical knowledge, data from this study will help meet the commitment made by MATC President, John R. Birkholz, when he pledged to students that "MATC has a commitment to your success and to providing a quality education." (MATC District Catalog 1997 – 98 p. iii).

The data in this study was gathered from fifteen (MATC) students who were enrolled in the HVAC program at the South Campus. The study asked the respondents to provide some demographic data. This helps to profile the students determining if any of these factors will play a role in the results. Each student's profile is explained in table one. This study will determine if any of the demographics will have any effect on the results.

TABLE 2			
SAMPLE DESCRIPTION			
Student #	Age	Gender	Ethnicity
1	19	M	Hispanic
2	24	M	White
3	18	M	White
4	24	M	African American
5	22	M	African American
6	28	M	White
7	37	M	White
8	18	M	Hispanic
9	51	M	Hispanic
10	20	M	White
11	27	M	Hispanic
12	40	M	White
13	50	M	White
14	21	M	White
15	23	M	Hispanic

Analysis Data

The data gathered in this study was designed to address a number of problems.

The following research questions were asked and the test used was developed to answer

these questions:

Research Question Number One

1. What was the motivational level of students entering the HVAC Program at

   MATC South Campus?

On the second day of class all the students enrolled in the HVAC program at

MATC South Campus were asked to take the MAT test. This test was designed to

acquire motivational data from adults who are in an education setting. This data will be

used to determine each student's motivational level. In table number two, this study

provides data gathered from the MAT test. This test has established a (general score characteristic) that is based on the total composite scores from a variety of motivational categories.

The data indicates that students enrolled in the HVAC program at South Campus enter the program with different motivational levels. As the data in table number two shows, students' motivational levels range from a low of nine to a high of twenty. A mean score of 13.86 was calculated by using the motivational scores of the MATC students enrolled the HVAC program. The data shows there were seven students whose motivational scores were in the normal range. There were four students below the normal range and four students above the normal range. Two students were slightly below the normal range and two students were well below the normal range.   This indicates that there are two students who will benefit, more than most, from strategies employed to help increase students' motivational levels. There were four students who scored above the normal range; each of these student's motivational scores were well above normal. These four students entering the HVAC program will need very little improving their motivational levels because they were already so high.

Table 3	
Students In The HVAC Program	
Student Number	General Scores Characteristic Motivational Levels
#1	10
#2	15
#3	19
#4	14
#5	11
#6	12
#7	20
#8	11
#9	12
#10	9
#11	13
#12	18
#13	19
#14	12
#15	13
Mean Score = 13.86	

Research Question Number Two

2. What are the motivational characteristics that affect success in the HVAC

   program at MATC South Campus?

   The MAT's test is a comprehensive test that provides data in many complex

areas. For this study the data was reviewed to determine what individual factors have

the most effect on the HVAC student's motivation. The study used description statistics

and independent variables to establish the means scores and standard deviation scores,

 in table number three. The data in table number three clearly indicates that some

motivational characteristics affect student success.

This is an explanation of the terms used to determine the motivational factors that affect the student's success in the HVAC program. These terms will be used in the data provided in table number three.

Career – The student's aspiration for success in a career or actual career accomplishment. Demonstrates the need to earn a good living or potential to earn a good living or having a useful skill.

Home – The student's emotional ties to a task or how he/she would view their work environment.

Fear – The student's ability to take a risk or try something new. The fear to experiment on a new project or try an unknown skill.

Narcism – The student's need to acquire personal satisfaction and a need to take care of their self. In a desire for personal comfort the student's need to take the easiest method of getting their work done.

Superego – The student's ability to follow rules or listen to an instructor. How well can the students follow behavioral procedure.

Self-Sentiments – The student's ability to handle difficult classroom situations or solve classroom problems.

Mating – The students ability to work in a group and contribute to a joint classroom project.

Pugnacity – The student's ability to quit if the work is too hard, he/she just does not understand the material, or a student's personal drive to continue even in difficult situations.

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Assertion – The student's ability to take charge of a situation. To work hard for a grade or

the development of a useful skill.

Sweetheart-Spouse – The student's importance to the other students, his/her group, or

instructor. How well is the student appreciated in class.

TABLE 4			
Factors Associated With Motivation			
Motivational Factors	Number	Scores	Standard Deviation
Career	15	3.5	+2.0
House	15	3.3	+1.3
Fear	15	4.0	+2.6
Narcism	15	4.6	+3.0
Superego	15	1.3	-.49
Self-Sentiment	15	1.2	-.56
Mating	15	2.5	-1.8
Pugnacity	15	3.1	-1.8
Assertion	15	2.2	-1.3
Sweetheart-Spouse	15	3.9	+2.3
Mean = 2.9			

Research Question Number Three

3. What motivation strategies will improve the student's success in the HVAC program

at MATC South Campus?

The study looked at the data in more detail to identify the best motivational predictors

needed to develop strategies that can be used to improve academic success. The students'

correlation coefficients were calculated relating all variables used in this study. The data shows

that there are five factors that are the best predictors of the students' motivational needs. The

general MAT scores characteristic which was a composite number used for a motivational

indicator in table one and table six will not be of much use to help determine motivation

strategies. The data in table five will provide greater linkage to the data gathered by this study,

and useful strategies developed to improve motivation. The top five motivational indicators have an asterisk. This data provides important information in determining strategies.

This data provides the information needed to identify the motivation strategies that will improve the student success in the HVAC program at MATC South Campus.

Table 5		
Summary of Significant Predictors of Academic Success		
Independent Variables : MAT Scores		
Correlation Rank	Variable	Coefficient Value (u)
#1	Mid-term grade	+0.7 *
#2	Home	-0.6 *
#3	Mating	-0.5 *
#4	Sweetheart-Spouse	-0.5 *
#5	Fear	+0.4 *

Research Question Number Four

4.   What is the correlation between motivational levels and success in the HVAC

program?

This study gathered data at three different periods of student development. The first data collected would determine the motivational level of the students entering the HVAC program. This data would consist of the composite results of the general MAT scores characteristic of the students. The total of these scores will determine the data of the individual student's dynamic motivational level as a whole. The next data would consist of the Laboratory Reports, Quizzes, and Homework grade which would make up the students mid-term grades. The final data that will be gathered to determine course success is the final grade. This data will consist of an evaluation of their overall performance. For this study, this final data will be the

determining factor that will relate to student success in the HVAC program. All this data will

be presented in the table six mid-term grade, general scores characteristics, and final grade.

      The data in table six indicates that there is a direct correlation between

motivational levels and success in the HVAC program. Table number six lists the highest

correlation between the MAT scores and the final grade.

Table 6

Total Data Acquired During Semester

Student Number	General Score MAT Characteristic	Mid – Term Grade	Final Grade
#1	10	C (2.00)	D (1.00)
#2	15	B (3.00)	A- (3.75)
#3	19	B+ (3.50)	B+ (3.50)
#4	14	B+ (3.50)	B- (2.75)
#5	11	D (1.00)	C (2.00)
#6	12	C- (1.75)	C (2.00)
#7	20	A (4.00)	A (4.00)
#8	11	C (2.00)	C (2.00)
#9	12	C (2.00)	C (2.00)
#10	9	D (1.00)	U (0.00)
#11	13	B (3.00)	C (2.00)
#12	18	B (3.00)	A- (3.75)
#13	19	A (4.00)	A (4.00)
#14	14	B (3.00)	C (2.00)
#15	15	B- (2.75)	C (2.00)

Using the general information section of the MAT test, this study was able to gather demographic data on each of the students. The data was used to determine if there is any correlation between their age, gender, or authenticity and success in the HVAC program at MATC South Campus.

This study, using the data provided by each student, answering the questions provided in the MAT tests was able to establish a general score characteristic. This general score characteristic was a composite of a number of motivational factors. Determining this composite score allowed this study to establish motivational levels of the students entering the HVAC program. This data provides information regarding student's motivational levels when entering the program. Motivational levels as a measurement can be used by this study but will not help when trying to establish motivational strategies. More in-depth data gathered by the MAT test will need to be used to determine strategies needed for students to gain success. A correlation between the data gathered about motivational factors and motivational characteristics will be determined in chapter five. These motivational characteristics will be used to determine some strategies to help improve the student's success in the HVAC program at MATC South Campus.

CHAPTER 5

SUMMARY

<u>Restatement of the Problem</u>

At Milwaukee Area Technical College (MATC) Heating, Ventilating, and Air
Conditioning (HVAC) students have problems succeeding. Some students come into
 class with low levels of motivation and consequently perform poorly.

A need exists to identify some motivational strategies that improve student
successes in the HVAC technical courses. The focus of this study was to determine the
impact student motivational levels have on student performance in HVAC courses at
MATC South Campus.

The purpose of this study was to identify the motivational levels of the student
entering the MATC South Campus HVAC program. These levels are determined by
using the Motivation Analysis Test (MAT) administered on the second day of class.

The second objective of this study was to develop strategies that will attempt to
improve student successes. These strategies will help instructors motivate the students in
the HVAC courses.

The study was designed to gather data that addressed the problem. The following
research questions were posed:

      1.   What is the motivational level of students entering the HVAC
              program at MATC South Campus?

      2.   What are the motivational characteristics that affect success in
              the HVAC program at MATC South Campus?

3.   What motivation strategies will improve each student's success

        in the HVAC program at MATC South Campus?

4.   What is the correlation between motivational levels and success

        in the HVAC program?

<u>Methods and Procedures</u>

This study gathered data on each student's motivational levels when entering

the HVAC program at MATC South Campus. Students entering the HVAC program

come from a wide variety of academic abilities. There are also many reasons for students

enrolling in the program. The data was used to determine if there is any correlation

between the motivational levels of the incoming students and their success in the HVAC

program at MATC South Campus. In order to determine the students' motivational levels

when entering the program, the Motivational Analysis Test (MAT) was administered

on the second day of class.

The MAT test is used in education, notably in selection and guidance, in

psychological clinics, and in industrial personnel work. It penetrates the region beyond

ability measurement and beyond personality qualities. This test covers a person's interest,

drives, and the strength of his/her sentiment and value system. The MAT test is a four

part, in-depth test that looks at all aspects of student motivation. The test was developed

to assess adult educational motivational factors, used for thirty years by trained

psychologists to help them understand what motivates adult students. The validity factor

of this test is very high because of its proven performance and test reliability. The study

also gathers student data at two other periods. After eight weeks of course completion

an evaluation of student progress will be made. This evaluation is the mid-term grade

developed from a combination of quiz scores, test grades, laboratory reports, and home

work assignments. Data from the mid-term grade is used to establish a correlation

between motivational levels and these grades. A comparison between these grades and

final grades also determine if there is a related time factor for the introduction of

the strategies needed. Finally, the overall final grades establish the level of student

 successes.

Major Findings

Data gathered by the MAT test has allowed the study to establish initial

motivational levels of the students entering the program. These initial motivational levels

were established by using the general scores characteristic. The individual score of each

student was derived by combining the scores of general autism, total integration, total

conflict, total strength of drive and interest, and intelligence-information. This data has

provided motivational numbers that range from a low of 9 to a high of 20. These

numbers are used to relate students' initial motivational levels to their success in the

HVAC program.

The MAT test has also provided more detail information on motivational factors. These

motivational factors are used to provide some important information that is used

to develop strategies. These strategies help students become motivated more

quickly and will increase their success rate. The data has confirmed that the mid-term

grade is the best indicator of what the student's final grade will be.

<p style="text-align:center">Conclusion and Recommendations</p>

Using the demographic information acquired from the MAT test the study was able to determine the age and ethnicity of each student. There were three groups established - Hispanic students, African-American students, and White students. This data shows a progression of changing grade by ethnicity, even though there was only a few students of each race tested. So the study concluded that ethnicity was not a factor when determining program success. Based on this conclusion it can be recommended that:

1. Ethnicity is not a factor so known specific strategies need to be developed.

2. Ethnicity has no effect on motivational levels of enrolled HVAC students.

   The age of each student was established for this study. This data concluded that the grades of the students over 30 years of age were much higher. Because of this major difference this study concluded that age is a major factor affecting students success in the HVAC program at South Campus. Based on this conclusion it can be recommended that:

1. Asking the older students to take more of a leadership roll in the groups.

2. Having older students work in groups with the younger students.

This study answered all four of the research questions. Question one, yes the MAT test did establish student's motivational levels. This data was calculated by using a general MAT composite score. This study was able to establish entering students motivational levels in the HVAC South Campus program by grouping a number of motivational factors. The study was able to conclude that students have different motivational levels when entering the HVAC program. Based on this conclusion it can be recommended that:

1. Give the students a short test, on the first day, to help identify the students with low motivational levels.

2. Implement motivational strategies on the first day of class.

In response to question number two, yes this study was able to identify motivational characteristics. In chapter four, table number three, of this study, the students' motivational data is listed. This motivational data was derived from the MAT test. These motivational factors were used to determine students' motivational characteristics. The study was able to conclude that student motivational characteristics do exist; also what the motivational characteristics that affect success in the HVAC program at MATC South Campus are.

Based on this conclusion it can be recommended that.

1. Strategies for each HVAC class be developed.

2. Some strategies will have more value to HVAC students than others.

In order to answer question number three, this study must again look at the individual motivational factors it has already identified. In chapter four, table number three, ten motivational factors are listed. This study needed to rank the ten motivational factor. This was done by determining what motivational factors were most important to the students' success. A mean score and standard deviation were developed for each motivational factor. The study was able to conclude that five motivational factors were more important to student success in the HVAC program. These five motivational factors are their mid-term grade, home, mating, sweetheart-spouse, and fear.

Based on this conclusion it can be recommended that:

1. The quicker strategies are established and used, the greater their impact on student success.

2. Have the students form their work groups on the first day of class giving the students more time to bond.

3. Assign the students or groups responsibilities for developing part of the classes laboratory work each day.

4. Assign each student different group responsibilities and rotate these duties each class period.

5. Assign more group grades.

6. Praise the students when their group does a good job.

7. Tell each student how important his/her contribution is to the progress of the group.

8. HVAC program. There was a direst correlation between the student's motivational level numerical Allow each student to track their own progress.

Question number four addressed the overall concern about motivational levels and success in the score and student success in the HVAC program. There was a direct correlation between the student's motivational level numerical score and student's success in the HVAC program. The study was able to conclude that the motivational levels, numerical score, were higher for students who did better on the final grade.

Based on this conclusion it can be recommended that:

1. Instructors need to determine motivational levels of students.

2. Instructors develop motivational strategies

3. To improve student success.

4. Instructors communicate with students to aid in developing strategies

Recommendations for Further Study

Further study must be done to determine if the strategies, used in this study, are the best ones and if they need to be expanded. Will these strategies work for all the students and can these strategies be modified to provide greater motivational levels for all students. The study was also limited to a small number of students and needs to include more students over a greater range of class work.

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